

son and Fort Apache, Ariz., 16th; Camp Grant, Ariz., 17th; Galveston, 2nd; Clarksville, Tex., 28; Memphis, 19th; New Orleans, 2nd, 18th; Key West, 6th, 7th, 8th, 14th; Wilmington, N. C., 6th, 21st; Charlotte, N. C., 5th; Chincoteague, Va., 6th.

OPTICAL PHENOMENA.

Halos have been observed with considerable frequency throughout the month in the various districts. Solar halos, with mock suns, have been rather numerous, but not of as marked brilliancy and perfection as those reported in December, 1880. The following stations report from 2 to 4 mock suns on the dates named: Fort Stevenson, Dak., 20th; Fort Totten, Dak., 6th, 7th, 8th; Spiceland, Ind., 12th; Pierce City, Mo., 22nd; Cheyenne, 26th; Yankton, 4th, 6th, 11th, 12th, 13th; St. Paul, 4th; Dubuque, 2th; Logansport, Ind., 27th; Bangor, Me., 16th. Nothing of importance was reported in respect to lunar halos, except the following: Clinton, Iowa, very brilliant; four mock moons, and above the body of the halo appeared the inverted arc of a circle. Fort Bennett, Dak., 22nd, 5:20 a. m., very brilliant lunar corona.

Polar Bands.—Prescott, Ariz., 5th; Detroit, 8th; New Corydon, Ind., 2nd, 3rd, 8th, 11th; Glenwood, Iowa, 11th; Yates Center, Kan., 14th, 16th; Gardiner, Me., 11th; Clear Creek, Neb., 11th, 12th; Auburn, N. H., 9th, 20th; Freehold, N. J., 16th; Vineland, N. J., 8th, 12th; Wytheville, Va., 7th, 15th.

Mirage.—Albuquerque, N. M., 8th.

MISCELLANEOUS PHENOMENA.

Meteors.—Punta Rasa, 21st, 10 p. m., quite brilliant; visible about three seconds; course SE. to NW.; disappeared at elevation of about 25° with a long train of incandescent vapor. Springfield, Ill., 1st, 7:48 p. m., large and very brilliant, light sufficient to attract the notice of a person within doors, reading by a coal-oil lamp; was first seen due north at about 25° above the horizon, when it moved downward to a point 47° east and disappeared; motion very slow; no trail or cloud; duration 15 seconds. Cleburne, Tex., 21st, 6:30 p. m., very brilliant. Wytheville, Va., 6th, 6:30 p. m., very brilliant, course S. to N., motion slow until it reached the zenith, when it burst, sending its fragments in every direction, color white; 24th, 8:50 p. m., quite brilliant, rather larger than Mars; started few degrees east of station and moved eastward toward Orion, sinking a little as it passed; no train at disappearance; a few moments later another meteor of splendid bluish-green color, larger than Venus, moved from Cassiopeia towards Saturn, but sunk more rapidly than its predecessor; exploded like a rocket, throwing its fragments in every direction. Woodstock, Vt., 6:45 p. m., quite brilliant; appeared in SW. about 40° above horizon; moved in a northerly direction, leaving a brilliant white train of light visible for about six seconds.

Earthquakes.—*Alaska*: The following graphic description of a remarkable series of shocks occurring in Sitka Alaska in *October* and *November*, 1880, and which lasted for several days, is taken from the report of a special correspondent of an Oregon paper: "October 26th, 6 to 8 a. m., clear with sun shining 9 a. m., cloudy, high wind 10 a. m., tornado 11 20 a. m., cyclone, thunder, lightning, rain and hail; 1:20 p. m., severe shock of earthquake—oscillations from true east to west. *Incidents*.—Sudden calm; rumbling; earth wave passed; second, severe upheaval with cracking and splitting noise in and beneath the ground; third, slight shock with apparent return wave. The houses of the town were regularly upheaved in the order in which they stood, showing a true wave. Time from first to third about 18 seconds. Short lull, followed by rain, hail and snow. 2:14 p. m., slight shock with little vibration. 8:46 p. m., two shocks coming from the same direction as the first. 27th, 5:35 a. m., mean time, two short and sharp shocks, direction from magnetic east to west; length of shocks and interval unnoted on account of rapidity of movement; oscillation from north to south and very perceptible, followed by snow, hail, rain and high wind. 9:15 p. m., sharp shock from southwest to northeast. 11:04'. 20" p. m., slight shock, with continued low rumbling for the space of 1 minute and 8 seconds, from east to west. 11.45, same. From 9 to 11, scud flying from southeast to northwest. Stars shining through the break of clouds. *Remarks*.—On Thursday, the 28th, there was no perceptible upheaval, nevertheless the phenomena was peculiar during the afternoon of that day or after meridian. I was under the impression that there was a quivering in the air, yet but few persons noticed the state of the atmosphere. Becoming satisfied that something unusual was in the elements, I watched for an effect; could only discover that nervous persons were seemingly very buoyant and restless, while others, particularly females, complained of loss of appetite, accompanied with a feeling of seasickness, and I thought I noticed a feeling akin to hysteria. Under the impression that I must be mistaken, about 6 p. m. I entered a well lighted saloon and there watched for an indication to relieve my doubts or confirm my opinion. Only one person of the whole number, there being about nine in the room, seemed to be affected. That individual, said to be one of the powerful men in the community, addressed himself to me personally several times, asking what I supposed ailed him; declined to answer the question and went to my present home. Retired for the night at 9 o'clock and 30 minutes; the